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WYETH LLC
PATENT LAW GROUP
5 GIRALDA FARMS
MADISON, NJ 07940

EXAMINER	
TONGUE, LAKIA J	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/796,925
Filing Date: March 10, 2004
Appellant(s): LI ET AL.

Mitchell Bernstein
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 2, 2009 and March 18, 2010 appealing from the Office action mailed January 7, 2009.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 22-24 are rejected and pending in the application.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

Johnson et al., Effect of dairy calves with an inactivated *E. coli* O157:H7 bacterin on shedding of *E. coli* O157:H7, 1999; Abstract 40 aP

Saito et al., U.S. 2005/0158330 A1

Baylor et al., Vaccine, 2002; 20: S18-S23

Elder et al., Journal of Animal Science, 2002; 80 (sup. 1): 151 (abstract 602)

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The rejection of claims 22 and 24 under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (Effect of dairy calves with an inactivated *E. coli* O157:H7 bacterin on shedding of *E. coli* O157:H7, 1999; Abstract 40 aP), Saito et al. (U.S. 2005/0158330 A1), and Baylor et al. (Vaccine, 2002; 20: S18-S23).

The rejection is on the grounds that Johnson et al. disclose a study to determine the effect of vaccinating dairy claves with an inactivated *Escherichia coli* O157:H7 bacterin on the shedding of Escherichia *coli* O157:H7 (see title). Johnson et al. disclose that six newly weaned calves were vaccinated intramuscularly with an inactivated *E. coli* O157:H7 bacterin. Moreover, Johnson et al. disclose that the shedding of the organism

by most calves in each group fell to 50 CFU/g of feces within 2-3 weeks of challenge (see abstract).

Johnson et al. do not specifically disclose an adjuvant comprising SP oil and aluminum hydroxide.

Saito et al. disclose oil adjuvant vaccines which include sorbitan fatty acid ester (e.g., sorbitan monooleate, etc.), non-ionic surfactants, having a polyoxyethylene chain in a molecule, such as polyoxyethylene sorbitan fatty acid ester polysorbate (e.g., polyoxyethylene(20)sorbitan monooleate etc.), polyoxyethylene polyoxypropylene glycol and the like (see paragraph 0034). Saito et al. disclose that the vaccine comprise antigens of inactivated cells from Gram negative bacteria such as *Escherichia coli* (see paragraph 0044). Moreover, the vaccine may contain, in addition to an antigen, an efficacious component such as an antibiotic (see paragraph 0045). Saito et al. disclose that suitable administration routes include subcutaneous, intramuscular and intraperitoneal injections (see paragraph 0066).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the invention of Johnson et al. with the teachings of Saito et al. because Saito et al. disclose a vaccine which comprises inactivated cells of *E. coli* antigen coupled with an adjuvant comprising the components of SP oil. Further, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the invention of Johnson et al. with the teachings of Saito et al. to use inactivated whole *E. coli* O157:H7 because it is highly potent and can cause severe infections. It would have been obvious to use the components together along with aluminum

hydroxide because aluminum hydroxide is a known adjuvant that is well known in the art to stimulate an immune response. As evidenced by Baylor et al., which disclose that aluminum hydroxide has been commonly used as an adjuvant in many vaccines for decades and have been proven safe (see abstract and page S21-Summary).

It would have been expected, barring evidence to the contrary, that the composition would be effective in reducing shedding of *E. coli* O157:H7 because all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention (KSR International Co. v. Teleflex inc., 500 U.S.-, 82 US{Q2d 1385 (2007). Moreover, KSR forecloses the argument that a **specific** teaching, suggestion, or motivation is required to support a finding of obvious. See the recent Board decision *Ex parte Smith,--USPQ2d--,* slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing *KSR, 82 USPQ2d* at 1396).

The method of the prior art is the same as that which has been claimed, consequently, the method necessarily produces minimal injection site reaction.

The rejection of claims 22-24 under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (Effect of dairy calves with an inactivated *E. coli* O157:H7 bacterin on shedding of *E. coli* O157:H7, 1999; Abstract 40 aP), in view of Saito et al. (U.S. 2005/0158330 A1), in view of Baylor et al. (Vaccine, 2002; 20: S18-S23) as set forth

above and further in view of Elder et al. (Journal of Animal Science, 2002; 80 (sup. 1): 151 (abstract 602)).

The rejection was on the grounds that Johnson et al. disclose a study to determine the effect of vaccinating dairy claves with an inactivated *Escherichia coli* O157:H7 bacterin on the shedding of Escherichia *coli* O157:H7 (see title). Johnson et al. disclose that six newly weaned calves were vaccinated intramuscularly with an inactivated *E. coli* O157:H7 bacterin. Moreover, Johnson et al. disclose that the shedding of the organism by most calves in each group fell to 0 CFU/g of feces within 2-3 weeks of challenge (see abstract).

Johnson et al. does not specifically disclose an adjuvant comprising SP oil and aluminum hydroxide or the optional pharmaceutically acceptable carrier.

Saito et al. disclose oil adjuvant vaccines which include sorbitan fatty acid ester (e.g., sorbitan monooleate, etc.), a non-ionic surfactant, having a polyoxyethylene chain in a molecule, such as polyoxyethylene sorbitan fatty acid ester polysorbate (e.g., polyoxyethylene(20)sorbitan monooleate etc.), polyoxyethylene polyoxypropylene glycol and the like (see paragraph 0034). Saito et al. disclose that the vaccine comprises antigens of inactivated cells from Gram negative bacteria such as *Escherichia coli* etc. (see paragraph 0044). The vaccine may contain, in addition to an antigen, an efficacious component such as an antibiotic (see paragraph 0045). Moreover, Saito et al. disclose that suitable administration routes include subcutaneous, intramuscular and intraperitoneal injections (see paragraph 0066).

Saito et al. do not specifically disclose the use of aluminum hydroxide.

Elder et al. disclose an intervention to reduce fecal shedding of *E. coli* O157:H7 in naturally infected cattle when administered neomycin (see page 151, abstract 602).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the teachings of Johnson et al., Saito et al., and Baylor et al. with the teachings of Elder et al. because it is obvious to combine two compositions (neomycin and inactivated or killed whole *E. coli* O157:H7) each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d 846, 850,205 USPQ 1069, 1072 (CCPA 1980). Providing the composition as a medicated feed would be obvious because it provides a more convenient means of delivery and would be more suitable for the improvement of intestinal function when fed to dairy animals such as cows, goats and ewes.

It would have been expected, barring evidence to the contrary, that the composition would be effective because all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention (KSR International Co. v. Teleflex inc., 500 U.S.-, 82 US{Q2d 1385 (2007). Moreover, KSR forecloses the argument that a **specific** teaching, suggestion, or motivation is required to support a finding of obviousness. See the recent Board decision *Ex parte Smith,--*

USPQ2d--, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing *KSR, 82 USPQ2d* at 1396).

(10) Response to Argument (a)

The rejection of claims 22 and 24 under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (Effect of dairy calves with an inactivated *E. coli* O157:H7 bacterin on shedding of *E. coli* O157:H7, 1999; Abstract 40 aP), Saito et al. (U.S. 2005/0158330 A1), and Baylor et al. (Vaccine, 2002; 20: S18-S23).

Appellants Argument #1

The Examiner has culled selective teachings from the prior art and thus failed to properly ascertain the scope and content of the prior art.

Examiners Rebuttal #1

Contrary to Appellants assertion, the method as claimed has been meet by the combination of teachings of the prior art. Johnson et al. disclose a study to determine the effect of vaccinating dairy claves with an inactivated *Escherichia coli* O157:H7 bacterin on the shedding of Escherichia *coli* O157:H7 (see title). Johnson et al. disclose that six newly weaned calves were vaccinated intramuscularly with an inactivated *E. coli* O157:H7 bacterin. Moreover, Johnson et al. disclose that the shedding of the organism by most calves in each group fell to 50 CFU/g of feces within 2-3 weeks of challenge (see abstract). The only deficiency in Johnson et al. is that they do not specifically disclose an adjuvant comprising SP oil (polyoxyethylene-polyoxpropylene block copolymer; squalene, polyoxyethylene sorbitan monooleate; and buffered salt solution) and aluminum hydroxide.

Saito et al. was combined with Johnson et al. to cure said deficiency. Saito et al. disclose oil adjuvant vaccines which include sorbitan fatty acid ester (e.g., sorbitan monooleate, etc.), non-ionic surfactants, having a polyoxyethylene chain in a molecule, such as polyoxyethylene sorbitan fatty acid ester polysorbate (e.g., polyoxyethylene(20)sorbitan monooleate etc.), polyoxyethylene polyoxypropylene glycol and the like as well as squalene (see paragraphs 0021, 0028 and 0034). Saito et al. disclose that the aqueous component of the vaccine is phosphate buffered physiological saline and the like (see paragraph 0048). Saito et al. disclose that the vaccine comprise antigens of inactivated cells from Gram negative bacteria such as *Escherichia coli* (see paragraph 0044). Moreover, the vaccine may contain, in addition to an antigen, an efficacious component such as an antibiotic (see paragraph 0045). Saito et al. disclose that suitable administration routes include subcutaneous, intramuscular and intraperitoneal injections (see paragraph 0066). Lastly, Saito et al. disclose that the vaccine comprises an aluminum hydroxide as an adjuvant (see paragraph 0101).

The two references teach vaccine composition which can be used to treat (i.e. reduce shedding) an infection related to *Escherichia coli.*

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Johnson et al. with the teachings of Saito et al. because Saito et al. disclose an oil adjuvant vaccine comprising inactivated cells of *E. coli* antigen coupled with an adjuvant comprising the components of SP oil. Further, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Johnson et al. with the

teachings of Saito et al. to use inactivated whole *E. coli* O157:H7 because it is highly potent and can cause severe infections. It would have been obvious to use the components together along with aluminum hydroxide because aluminum hydroxide is a known adjuvant that is well known in the art to stimulate an immune response. As evidenced by Baylor et al., which disclose that aluminum hydroxide has been commonly used as an adjuvant in many vaccines for decades and have been proven safe (see abstract and page S21-Summary).

It would have been expected, barring evidence to the contrary, that the composition would be effective in reducing shedding of *E. coli* O157:H7 because all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention (KSR International Co. v. Teleflex inc., 500 U.S.-, 82 US{Q2d 1385 (2007). Moreover, KSR forecloses the argument that a **specific** teaching, suggestion, or motivation is required to support a finding of obvious. See the recent Board decision *Ex parte Smith,--USPQ2d--*, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing *KSR, 82 USPQ2d* at 1396).

Appellants Argument #2

The Examiner has improperly failed to give weight to the Li Declaration because she has required a comparison between the claims and Applicant's invention, rather then the prior art.

Examiners Rebuttal #2

The Examiner required that the comparisons of the declaration be commensurate in scope with the claims of the invention and that of the prior art. The Appellant, via the declaration, demonstrated that the average increased in the vaccine group that was administered the vaccine as claimed when compared to the vaccine group that was administered the inactivated bacterin and the standard adjuvant which consisted of aluminum hydroxide. However, the combination of references as applied to the instantly claimed invention are proper and would be expected, absent evidence to the contrary, to have a significant improvement in titers versus the standard adjuvant (aluminum hydroxide) as well. Moreover, the specification is silent with regard to how an increase in titer results of serology testing correlates to the reduction of shedding.

Appellants Argument #3

Johnson discloses that there was little difference in levels and duration of shedding in vaccinated versus control animals. Johnson thus fails to disclose an "effective amount" of a vaccine for reducing shedding of *E. coli* O157:H7.

Examiners Rebuttal #3

While Johnson makes the statement that there was little difference in levels and duration of shedding in vaccinated versus control animals; Johnson further discloses that shedding of the organism by most calves in each group fell to <50 CFU/g of feces within 2-3 weeks of challenge. Please note that the claims as drafted do not require the vaccine composition to meet a certain quantity of shedding of *E. coli* O157:H7 in an animal. What the claims do require is that the vaccine composition be used in a method for reducing shedding of *E. coli* O157:H7 in an animal. By definition, if the shedding

was only reduced by a percentage point of any given number, the prior art has met the limitation of reducing shedding of *E. coli* O157:H7 in an animal.

Moreover, with regard to Appellants argument that Johnson fails to disclose an "effective amount" of a vaccine for reducing shedding of *E. coli* O157:H7, Appellant is arguing a point that is not required by the claims. The claims recite an effective amount of a vaccine composition, but do not specifically recite what the "effective amount" is. One of skill in the art could conceive what an effective amount equates to once said artisan was presented with proper data such as age and weight of the animal to be vaccinated.

Appellant Argument #4

Johnson states that infection of naturally-weaned dairy calves by *E. coli* O157:H7 "is unlikely to be controlled by immune response induced by parenterally administered inactivated bacterins."

Examiners Rebuttal #4

The claims are broadly drawn to "animal", which would include naturally-weaned dairy calves as well as a whole host of other animals who are susceptible to the infection. Moreover, Johnson stated that it is unlikely, which does not explicitly say that the infection can not be controlled by immune responses induced by parenterally administered inactivated bacterins.

Appellant Argument #5

Baylor teaches that aluminum adjuvants "have been associated with severe local reactions such as erythema, subcutaneous nodules and contact hypersensitivity."

Examiners Rebuttal #5

While Baylor teaches that aluminum adjuvants "have been associated with severe local reactions such as erythema, subcutaneous nodules and contact hypersensitivity", it is the Examiner's position that a compound may have an adverse reaction in certain subjects, however, this does not imply that the composition that has been used for decades can not be effectively used in a composition. Moreover, the claimed composition does not have a particular amount for the aluminum hydroxide; consequently, the invention as claimed may lead to an allergic reaction.

Appellant Argument #6

Saito never states or suggest that aluminum hydroxide could or should be used in a W/O/W adjuvant.

Examiners Rebuttal #6

While Saito does not disclose a W/O/W adjuvant comprising aluminum hydroxide, Saito, which discloses oil adjuvant vaccines, does suggest the use of aluminum hydroxide. Coupling the suggestion of Saito with the evidentiary teachings of Baylor, who discloses that adjuvants are well known in the art to stimulate an immune response and that aluminum hydroxide has been commonly used as an adjuvant in many vaccines for decades and have been proven safe; one of skill in the art has proper motivation, teaching and suggestion to combine an oil adjuvant with aluminum hydroxide.

Appellant Argument #7

Hindsight reconstruction is improper.

Examiners Rebuttal #7

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

(10) Response to Argument (b)

The rejection of claims 22-24 under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (Effect of dairy calves with an inactivated *E. coli* O157:H7 bacterin on shedding of *E. coli* O157:H7, 1999; Abstract 40 aP), in view of Saito et al. (U.S. 2005/0158330 A1), in view of Baylor et al. (Vaccine, 2002; 20: S18-S23) as set forth above and further in view of Elder et al. (Journal of Animal Science, 2002; 80 (sup. 1): 151 (abstract 602)).

Appellants Argument #1

For all the reasons above, claims 22 and 24 are patentable over Johnson in view of Saito and Baylor. Further, because the Examiner does not cite Elder in connection with claims 22 and 24 and Elder does not, in fact cure any of the defects set out above in section (1) concerning the rejection of claims 22 and 24 over Johnson, Saito and

Baylor, it follows that claims 22 and 24 are not obvious over Johnson in view of Saito, Baylor and Elder.

Examiners Rebuttal #1

Please not for all the reasons above, claims 22 and 24 are unpatentable over Johnson in view of Saito and Baylor. Moreover, a prior art reference used to make a secondary rejection should not be overlooked simply because it was not included in the primary rejection. As stated previously, claims 22 and 24 are unpatentable over Johnson in view of Saito and Baylor. This rejection was primarily to encompass/meet the limitation of claim 23, which is drawn to the method of claim 22, further comprising administering an effective amount of *Lactobacillus acidophilus* or neomycin medicated feed supplement to the animal.

Elder et al. disclose an intervention to reduce fecal shedding of *E. coli* O157:H7 in naturally infected cattle when administered neomycin (see page 151, abstract 602). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Johnson et al., Saito et al., and Baylor et al. with the teachings of Elder et al. because it is obvious to combine two compositions (neomycin and inactivated or killed whole *E. coli* O157:H7) each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d 846, 850,205 USPQ 1069, 1072 (CCPA 1980). Providing the composition as a medicated feed would be obvious because it provides a more convenient means of delivery and

would be more suitable for the improvement of intestinal function when fed to dairy animals such as cows, goats and ewes.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Lakia J Tongue/

Examiner, Art Unit 1645

Conferees:

Robert Mondesi

/Robert B Mondesi/

Supervisory Patent Examiner, Art Unit 1645

Jeffrey Stucker

/Jeffery Stucker/

Supervisory Patent Examiner, Art Unit 1648